

I. REMARKS

A. Status of Claims

Examiner lists the status of the claims as follows:

1. Claims 1-27 and 51-57 are pending in the Application;
2. Claims 3, 5, 6, 8-11, 13-16, 18-26, and 53-57 are withdrawn from consideration;
3. Claims 1, 2, 4, 7, 17, and 27 are rejected.

Although Examiner omits Claims 51 and 52 from the list of rejected claims, the claims are specifically rejected under 35 USC §103(a) at page 6 of the Office Action dated 08/17/2009; accordingly, these claims should be listed as rejected.

The cancellation Claims 28-50 and the withdrawal of the claims listed in point 2 above should not be construed as an abandonment of the subject matter covered by the cancelled and withdrawn claims. Applicants reserve the right to file one or more divisional applications directed to this subject matter.

C. Petition for Extension of Time

Accompanying this Response is a Petition for Extension of Time (PTO/SB/22) for a 2-month extension of time as well as the required fee.

D. Information disclosure Statement

Examiner's attention is directed to the IDS (PTO/SB/08a) which accompanies this submission. The IDS is filed to cite WO 02/32227 A1 titled, "Herbicide Composition" which was cited in the International Search Report of Applicants' corresponding PCT application (PCT/US04/00554).

II. REJECTION UNDER 35 USC §102(b)

Claims 1, 2, 7, 17, and 27 stand rejected under 35 USC §102(b) as being anticipated by Ward *et al.* (US 6,093,681) and Gillespie *et al.* (US 6,093,680).

The Ward and Gillespie references are related to each other as both claim priority to the same provisional applications. The Ward and Gillespie references are both assigned to Monsanto Company the inventor of Roundup® (glyphosate) herbicide. Monsanto has formulated glyphosate in a myriad of forms many of which are described in Ward at Col. 4, lines 51-65 and Col. 5, lines 1-18. These formulations include:

1. Ready to spray dilute aqueous

- solutions;
- 2. Shelf-stable aqueous concentrate that must be diluted before application;
- 3. Shelf-stable granular composition that must be added to a liquid usually water before application;
- 4. Oil in water (O/W) emulsion;
- 5. Water in oil (W/O) emulsion;
- 6. Water in oil in water (WOW) emulsion; and
- 7. Liposomes.

An emulsion is a 2-phase system containing a continuous phase and a discontinuous phase dispersed therein. A microemulsion is a quite different type of colloidal dispersion from mini- and normal emulsions. Normal emulsions have a discontinuous phase particle size having a radius of 1 – 10 μm . A mini-emulsion usually has a discontinuous phase particle size of about 400nm. In contrast, a microemulsion has a discontinuous phase particle size having radii in the 10nm range. While common emulsions and mini-emulsions are inherently colloidally unstable, a microemulsion is a thermodynamically stable system.

Neither the Ward reference nor the Gillespie reference describes or claims any microemulsion much less the non-aqueous oil-continuous microemulsion taught by the present invention.

Examiner contends that Ward et al teach a composition comprising 20% glyphosate, Span 80 (surfactant), Tween 20 (polyoxyethylene sorbitol) surfactant, and butyl stearate (fatty acid ester) and points to Example F-1 and F-2.

Claims 1, 2,4,6,7,17,and 27 are further rejected as being anticipated by the Gillespie *et al* reference (US 6,093,680), Examiner asserting that Gillespie *et al* teach a composition comprising 20% glyphosate, Span 80 (surfactant), Tween 20 (polyoxyethylene sorbitol) surfactant, and methyl oleate (fatty acid ester). Examples 12-17 are cited in support of the Section 102 rejection.

The compositions (formulations) disclosed by Ward and Gillespie in the cited Examples are all water-in-oil-in-water multiple emulsions. One skilled in this art would recognize that the physical form of the formulation is critical. As evidenced by the references cited by Examiner and the references cited by Applicants herein, although agricultural formulators use the same building blocks, e.g., surfactants, stabilizers, antioxidants, etc., to formulate active agents such as herbicides how they put the parts of the formulation together is very different. A water-in-oil-in-water multiple emulsion

is not the same physical entity as a regular microemulsion much less the non-aqueous, oil-continuous microemulsion of Applicants' invention.

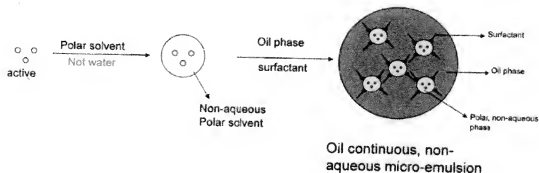
In order to "anticipate" an invention a prior reference must disclose to one of ordinary skill in the art all elements and limitations of the patent claim. See *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 927 F.2d 1565, 1576 (1991). If the prior art reference lacks an element of a claim at issue it can not anticipate. See *Al-Site Corp v. Opti-Ray Inc.* 28 USPQ2d 1915, 1920 (E.D. N.Y. (1993).

Examiner asserts that the recitation of the term, "non-aqueous, oil-continuous microemulsion" does not give patentable weight to the pending claims because the term does not limit the composition to a particular particle size to limit the composition to only being a microemulsion.

The words "non-aqueous, oil-continuous microemulsion" used in Applicants' claims are not merely descriptive but are substantive limitations on the specific composition described by independent Claim 1. Further, as would be recognized by one skilled in this art, the phrase "non-aqueous, oil-continuous microemulsion" refers to a specific type of microemulsion which does not contain any water.

Applicants' attorney conducted a Boolean search of the claims of US issued patents and patent applications for the period 1980 to the present using the term "microemulsion." The search returned 2166 hits. Table I attached hereto as Exhibit I shows selected claims from some of the patents and patent applications searched. Clearly those skilled in the art, as well as the USPTO, regard the term "microemulsion" as a term of art having an art recognized meaning. Examiner's attention is drawn to the term "microemulsion" in Claim 1 of US Pat. 7094735. Clearly the term conveys patentability to the claim, otherwise the claim is reduced to a composition having the following well known 4 elements, (i) a herbicide in acid form, (ii) surfactant, (iii) acidifying agent; and (iv) water.

The microemulsion of the invention is illustrated below. The graphic illustrates the physical form of Applicants' microemulsion which is not merely a "composition" but a particular composition having a specific physical form and with all the well known properties of a microemulsion.



As taught in the specification ([0053] & [0054]), an oil-continuous microemulsions can be described as a special case of inverse-micellar solution. In oil-continuous microemulsions, the water or polar-solvent core of the inverse-micelles may be larger than those of simple inverse-micellar solutions and they may contain a solute. Microemulsions, like micellar and inverse-micellar solutions, are transparent single-phase liquids, which are at thermodynamic equilibrium and therefore indefinitely stable over time. However, microemulsions may not remain stable if their temperature varies over a wide range. Among oil-continuous microemulsions, those that contain non-aqueous polar solvents possess better temperature stability than those containing water. Microemulsions are not simply emulsions with "micro" droplets inside of them. In microemulsions, the molecules forming the aggregates are continuously moving in and out of the aggregates because of their thermal motion.

In order to "anticipate" an invention a prior reference must disclose to one of ordinary skill in the art all elements and limitations of the patent claim. See *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 927 F.2d 1565, 1576 (1991). If the prior art reference lacks an element of a claim at issue it can not anticipate. See *Al-Site Corp v. Opti-Ray Inc.* 28 USPQ2nd 1915, 1920 (E.D. N.Y. (1993)). It is respectfully contended that neither the Ward reference nor Gillespie reference disclose all elements and limitations of the patent claims as neither reference discloses a "non-aqueous, oil-continuous microemulsion." Accordingly, Examiner's rejection under Section 102(b) is overcome.

III. REJECTION UNDER 35 USC §103(a)

A. The Invention

The invention claimed herein and described in the above drawing, described herein is directed to a non-aqueous, oil-continuous microemulsion comprising (i) an oil component, (ii) a non-aqueous polar solvent, (iii) an amphiphilic compound and (iv) the active agent which is a polar agrochemical complex which is a herbicide and preferably N-phosphonomethyl glyphosate (PMG).

B. Rejection under Section 103 over Gillespie in view of Iwasaki

Claim 12 is rejected under Section 103 as being unpatentable over Gillespie taken with Iwasaki (US 5,612,322). Examiner states that Applicants claim a composition where Claim 12 limits the polar solvent to an amine selected from ethylene diamine, ethanolamine, diethanolamine, triethanolamine, and combinations thereof.

Examiner asserts that Iwasaki teaches that ethylene diamine, ethanolamine, diethanolamine, triethanolamine, and combinations thereof are excellent activating agents for biocides in combination with monoesters, particularly polyoxyalkylene alkyl ethers (Col. 2, lines 5- 16). The biocides include glyphosate (Col. 3, lines 29-31).

C. Rejection under Section 103 over Gillespie in view of Iwasaki and Kuchikata

Claims 51 and 52 stand rejected under 35 USC §103(a) as being unpatentable over Gillespie in view of Iwasaki, and further in view of Kuchikata *et al.* (US 6,228,807).

Examiner states that Claim 51 and Claim 52 specify that the polar solvent is monoethanolamine while Claims 51 and 52 describe the amphiphilic material to be selected from N, N-(dihydroxyethyl) oleylamine and polyoxyethylene (2) oleyl ether and combinations thereof and specifically (Claim 52) polyoxyethylene oleyl ether.

Examiner admits that Gillespie and Iwasaki do not teach the use of polyoxy-alkylene alkyl ethers with activating agents such as monoethanolamine. However, Kuchikata does teach the use of polyoxyethylene oleyl ether surfactant with glyphosate (Col. 2, lines 58-65 and Col.6, line 3).

Based on this reasoning, Examiner contends that it would have been obvious to one of ordinary skill at the time of Applicants' invention to combine the teachings of Gillespie, Iwasaki and Kuchikata to include polyoxyethylene oleyl ether. One would have been motivated to include polyoxyethylene oleyl ether because Kuchikata teaches that it is a suitable surfactant and since Iwasaki teaches that polyoxyalkylene alkyl ethers are combined with activating agents such as monoethanolamine in glyphosate formulations.

1. The Iwasaki Reference

The Iwasaki reference (US 5,612,322) teaches the use of “activators” to enhance the activity of biocides such as herbicides among which is glyphosate. The reference does not teach the use of polyoxyethylene alkyl ether surfactants and specifically polyoxyethylene oleyl ether but rather, the activators disclosed by Iwasaki (Col. 1, lines 25-41) include an alkyl phosphate, an alkenyl phosphate, a hydroxyalkyl phosphate, a polyoxyalkylene alkyl ether phosphate, a salt thereof, a polyoxyalkylene alkenyl ether phosphate, a salt thereof, a polyoxyalkylene hydroxyalkyl ether phosphate and a salt thereof.

Further there is noting in Iwasaki which describes or suggests the non-aqueous, oil-continuous microemulsions of Applicants’ invention. Iwasaki teaches that his invention may be provided in the form of an emulsion concentrate which comprises 10 to 70 weight percent of the biocide and 10 to 50 weight percent of the biocide activator, 3 to 20 weight percent of an emulsifier and 10 to 50 percent weight of an organic solvent, or a dilute composition which comprises 100 to 5,000 ppm of the biocide, preferably 500 to 5,000 ppm, of the biocide activator and a carrier for dilution.

Clearly, in the invention taught by Iwasaki, the polyoxyalkylene hydroxyalkyl ether phosphate activators are not taught as the same thing as emulsifiers such as polyoxyethylene oleyl ether. In fact, Kao, the assignee of the Iwasaki reference markets such ether emulsifiers under the trade name “EMULGEN”.

2. Kuchikata et al Reference

The Kuchikata et al reference (US 6,228,807) is directed to a dry, water soluble, and/or water dispersible granular herbicide composition. There is noting in the Kuchikata reference that describes a microemulsion much less the specific microemulsion of Applicants’ invention.

The references of record disclose the types of herbicidal formulations listed in Table I below.

Table I
PRIOR ART HERBICIDE PRODUCT FORMS
1. Ready to spray dilute aqueous solutions;
2. Shelf-stable aqueous concentrates that must be diluted before application;
3. Shelf-stable granular composition that must be added to a liquid usually

water before application;
4. Oil in water (O/W) emulsion;
5. Water in oil (W/O) emulsion;
6. Water in oil in water (WOW) emulsion; and
7. Liposomes.

The invention described herein is directed to a water-free (non-aqueous), oil-continuous microemulsion containing a herbicide as the active agent where the active agent is solubilized in a non-aqueous polar solvent. None of the references cited herein describe or suggest a microemulsion much less water free, oil continuous microemulsions.

Monsanto Company the original developer of Roundup® (N-phosphonomethyl glycine or glyphosate) herbicide has obviously been highly motivated to develop advantageous formulations of glyphosate as evidenced by the teachings of Ward et al and Gillespie et al cited by Examiner herein.

Despite all of the work done to develop commercial formulations of glyphosate herbicide, none of the references of record teach the use of a water-free, oil-continuous microemulsion. Further, even if the references did lead one to prepare oil-continuous microemulsions, the references do not provide any teaching or expectation that one would achieve the superior herbicidal results achieved by Applicants formulation when applied to undesirable vegetation.

As evidenced by the data reported in Applicants' specification, the oil-continuous microemulsions of Applicants' invention out-performed Roundup® herbicide when sprayed on undesirable weeds and when applied to a field of Roundup® resistant soybean plants. The data in Table 8 indicates that at the same dose of active agent (kg/Ha), when microemulsions formulated in accordance with Applicants' invention were applied to ragweed, velvetleaf and giant foxtail, Applicants formulations controlled ragweed and velvetleaf over 50% better than Roundup while controlling giant foxtail at the same rate.

Table 10 illustrates the superior biological performance of formulations of the invention. At 14-days after the herbicide was applied all of the invention formulations provided 100% kill the same kill rate as Roundup. However, the invention formulations were able to do so when applied at rates at least half that of the conventional Roundup dose. When visual observations were made 4-days after treatment, the invention formulations that were applied at a much lower rate than the conventional Roundup rate of 2.08 kg/Ha produced about the same rate of kill as the Roundup formulation conventional dose (about 60% kill). However, when Roundup was applied at half its recommended dose (1.04 kg/Ha), significantly less kill was observed. The data in Table

10 clearly illustrates that using lower concentrations of the oil-continuous microemulsions of the invention (kg/Ha) one was able to achieve the same results (i.e., kill of weeds) as was obtained at the much greater conventional dose of Roundup.

It is respectfully contended that Examiner has not made out a case of *prima facie* obviousness. None of the references of record describe or suggest a water free, oil-continuous microemulsion much less the particular microemulsion claimed herein.

Based on the arguments and evidence provided herein, it is respectfully asserted that Applicants' invention as a whole is patentable and should not be limited to the previously elected species. Accordingly, Examiner is requested to reinstate the withdrawn claims and to examine them for compliance with Section 112.

IV. CONCLUSION

Based on the amendments and arguments made herein, it is respectfully asserted that Examiner's rejections have been overcome and that this application is in condition for allowance. Examiner is respectfully requested to withdraw all rejections and to issue a Notice of Allowance. If there are any questions regarding these amendments and remarks, Examiner is encouraged to contact the undersigned at the telephone number provided below.

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